

Task Order 35-10 Constellation EVA Systems

1.0 TITLE OF EFFORT: Constellation Extravehicular Activities (EVA) Support (WBS 1.5.6.3)

2.0 TASK DESCRIPTION:

Coordinate and conduct S&MA activities for authorized Constellation Program quality and flight equipment projects (which may include GFE and CFE), provide and discuss S&MA topics and issues, and participate in all S&MA activities associated with the GFE lifecycle as defined in EA-WI-023 and EA-WI-025. Provide support to on-orbit operations including integrated operations assessments. Review proposals and change requests for system designs and design modifications in order to assess S&MA impacts and identify S&MA issues for GFE assets.

2.1 STATEMENT OF WORK REFERENCE: Section 5.0 - Program Support, Section 6.0 - JSC Project Support, Section 8.0 - Advanced Programs, Assurance Methodologies, and Special Processes

2.2 Constellation Extravehicular Systems (WBS 1.5.6.3)

Provide S&MA support to Constellation Extravehicular (EVA) Systems Project Office activities.

2.2.1 Constellation EVA S&R support (WBS 1.5.6.3.x)

- a. Assist in the development of S&MA requirements to be applied to EVA-related hardware, equipment, operations, and facilities.
- b. Assess and evaluate proposed concepts and designs, and identify S&MA issues related to the item or its operational usage.
- c. Participate in development and modification of EVA hardware, equipment and facilities to identify and discuss hardware criticality assessments and define S&MA requirements. Identify design problems and provide design solutions or improvements.
- d. Participate in design reviews, review provided data and documentation, and provide RID'S on S&MA-related issues and deficiencies.
- e. Identify potential hazards, evaluate proposed hazard controls, and evaluate methods for verification of hazard controls.
- f. Identify potential critical items list failure modes, causes, effects, methods of verification, and acceptance rationale.
- g. Track and provide status on requirements verification, system qualification, and design certification activities.
- h. Identify missing or non-compliant S&MA requirements as well as performance requirements that cannot be verified.
- i. Conduct S&MA assessments, prepare presentations, and present results of those assessments to S&MA management, project management, and the Constellation EVA System Project for discussion.
- j. Assure that hardware operational uses, operating limits, hazard controls, and fault tolerance are verified prior to flight.
- k. Provide project inputs to the project PRA to help provide for the Loss-of-crew/loss-of-mission estimates.
- l. Participate in problem/anomaly investigations during all phases of a project to assure that the problems are appropriately documented; adequate and appropriate investigation is planned and conducted; closure rationale is acceptable and complete; and visibility of the problem/anomaly is elevated to the appropriate S&MA management level.
- m. Support operational use of EVA-related hardware, equipment and facilities.
- n. Provide support to the EVA Systems Project Control Boards and sub-boards including assessing S&MA issues and risk impact for all Change Requests.
- o. Provide support to boards, panels, RID reviews, etc., act as the S&MA representative as necessary and as directed by the NASA customer.

2.2.2 Constellation Program Quality Assurance (QA) (WBS 1.5.6.3.x)

Perform Quality Assurance (QA) functions for the Constellation EVA Project

- a. Perform program directed analysis of quality assurance related requirements.
- b. Perform Change Requests analysis for Constellation related directives, requirements per Program Office Direction.
- c. Participate in design reviews and milestones to ensure compliance with Program and Project Quality Assurance requirements.
- d. Perform reviews of Project documentation to ensure compliance with Program and Project Quality Assurance requirements.
- e. Prepare for, and implement the PRACA system support for the EVA Project.

2.2.3 Constellation Program Quality Engineering (QE) (WBS 1.5.6.3.x)

Perform Quality Engineering (QE) functions for the Constellation EVA Project

- a. Perform program directed analysis of quality assurance related requirements.
- b. Perform Change Requests analysis for Constellation related directives, requirements per Program Office Direction.
- c. Develop program related directives, requirements, and change requests dealing with quality and provide tracking and support to program representatives.
- d. Assess and evaluate proposed concepts and designs, and identify quality issues related to the item or its operational usage.
- e. Participate in design reviews, review provided data and documentation, and provide RID'S on quality-related issues and deficiencies.
- f. Conduct quality assessments, prepare presentations, and present results of those assessments to S&MA management, project management, and the Constellation EVA System Project for discussion.
- g. Perform facility certifications and surveillance as directed by the Program Office
- h. Perform Program directed investigations of anomalies
- i. Perform and report on Quality audits as directed by the Project Office

2.3 DELIVERABLES

Requirements Verification and Certification Status

S&MA Assessments and Presentations

RIDS

Audit Reports

Weekly Activity Report and Metric scoresheet

Technical and metric analysis

Subcontractor performance reports

Draft letter of delegations

Recommendations for acceptance of ADPs and GCARs

QREX Reports

3.0 PERIOD OF PERFORMANCE: October 1, 2009 - April 30, 2010

4.0 ESTIMATED COSTS:

Contractor may provide travel, training, materials, and other non-labor resources as necessary to support task order requirements. Training may include selected professional discipline-based or spaceflight-based conferences with approval of the TMR.

Task Order 36-10 MOD Support

1.0 TITLE OF EFFORT: Constellation GFE Projects and CFE Quality Support (WBS 1.5.6.4)

2.0 TASK DESCRIPTION:

Coordinate and conduct S&MA activities for authorized Constellation Program quality and flight equipment projects (which may include GFE, CFE, and payloads), provide and discuss S&MA topics and issues, and participate in all S&MA activities associated with the GFE lifecycle as defined in the applicable work instructions or plans (i.e., MOD Software Management Plan, etc). Review proposals and change requests for system designs and design modifications in order to assess S&MA impacts and identify S&MA issues for GFE assets.

2.1 STATEMENT OF WORK REFERENCE: Section 5.0 - Program Support, Section 6.0 - JSC Project Support, Section 8.0 - Advanced Programs, Assurance Methodologies, and Special Processes

2.2 Mission Operations (MO) Support (WBS 1.5.6.4.x)

Provide S&MA support to CxP Mission Operations (MO) activities to include support for the MCCA, Cx Training Facility, MORA and CxPASS.

2.2.1 MCCA Support (WBS 1.5.6.4.x)

2.2.1.1 Provide S&MA support to Mission Operations Directorate (MOD) MCCA activities to include:

1. S&MA work schedule(s) to meet the Project schedule.
 - 1.1 Assess and provide S&MA recommendations for MCCA Project generated presentation materials required for the MCCA milestones
 - 1.2 Provide inputs to and participate in the MCCA Preliminary Design Review (PDR).
 - 1.3 Provide for the S&MA review and assessment of MCCA Project documents, plans, presentations, and analysis in support of Project milestones, reviews and meetings.
 - 1.4 Generate S&MA comment Sheets and/or Review Item Dispositions (RIDs) and track to closure.
 - 1.5 Provide inputs to the MCCA Critical Design Review (CDR)
2. Assessments, assurance, and analysis in accordance with the schedule.
 - 2.1 Perform software process assessments
 - 2.2 Provide / maintain a software classification assessment and software safety assessment
 - 2.3 Provide the Project Office with a task by task status of S&MA events and actions based on the schedule inputs to the Project master schedule.
 - 2.4 Support the integration of S&MA products / issues between the Level IV Elements and Level III
3. Product assessments and support to applicable safety boards/panels.
4. Support S&MA related presentations for Project and Program boards, panels, and meetings.
 - 4.1 Provide S&MA support to applicable safety boards/panels.
5. Provide S&MA inputs to appropriate Project documents.
6. Provide S&MA expertise for Project safety assessments
7. Provide S&MA support for the assessment of Project directed Trade Studies.
8. Provide software assessments for Project software, firmware, and future up-linkable files in accordance with the MOD SMP.
9. Review S&MA portions of the various Level II documents and Level III Project Plans and documents. (i.e.- SMP, MOD SR&QA Plan, BOP, SRD, CARD, etc...)
 - 9.1 Provide recommendation on adherence to Level III SR&QA Plan, Level III Software Management Plan and ensure deviations are documented in project documentation (i.e. PMP).

10. Review Project requirements (i.e.- Requirements Specifications, Interface Control Documents (ICD), Software Development Plan (SDP), Software Requirements Specifications, Software Design Documents, etc...) and provide applicable comments, and inputs
 - 10.1 Provide S&MA review and assessment of the MCCS software requirements (i.e. Level A, B, C, etc)
 - 10.3 Provide S&MA review and assessment of the MCCS Software Development Plan (SDP)
 - 10.3 Provide S&MA review and assessment of the MCCS Risk Management Plan (RMP)
 - 10.4 Provide S&MA review and assessment of the MCCS Configuration Management Plan (CMP)
 - 10.5 Provide S&MA review and assessment of the MCCS Test and Verification Plan (T&VP)
 - 10.6 Provide S&MA review and assessment of any other MCCS Project documents
 - 10.7 Provide S&MA review and assessment of the MCCS ICDs
 - 10.8 Review, verify and track the traceability of parent/child requirements
 - 10.9 Review and recommend approval/disapproval of Verification/Validation of requirements
11. Provide Safety Data Package assurance as required to support the Project through PDR. This will include the requirement to provide closure through the appropriate Project tracking log and verification of the log for S&MA items. The tracking log(s) shall be provided by the Project.
 - 11.1 Provide for the assessment of the System Preliminary Hazard Analysis (HA) and System Hazard Analysis.
12. Provide for the S&MA Preparation and review of Program/Project Change Requests.
13. Provide S&MA support to the various Program/Project safety boards and panels.
14. Initiate (where applicable) and track to closure Anomaly Reports and work them through the Program/Project System.

2.2.2 Training Facility Support (WBS 1.5.6.4.x)

2.2.2.1 Provide S&MA support to Mission Operations Directorate (MOD) Constellation Training Facility (CxTF) activities to include:

1. Provide a task-by-task review of S&MA tasks and analyses for CxTF, with references to specific entries in applicable documents
 - 1.1 Provide software Safety Data Package assurance as required to support the PDR. This will include the requirement to provide closure through the appropriate Project tracking log and verification of the log for S&MA items. The tracking log(s) shall be provided by the Project.
 - 1.2 Begin the preparation cycle, assessments and reviews to provide S&MA software support the various Preliminary Design Reviews that will begin in FY 2010.
 - 1.3 Provide S&MA software support to applicable safety boards/panels.
 - 1.4 Support S&MA software related presentations for Project and Program boards, panels, and meetings
 - 1.5 Provide S&MA software expertise for Project safety assessments
2. Support for the preparation and assessment of the System Preliminary Hazard Analysis (HA) and System Hazard Analysis.
 - 2.1 Provide for the preparation and assessment of the CxTF System Preliminary Hazard Analysis (HA) and System Hazard Analysis.
3. Provide recommendation on adherence to Level III SR&QA Plan and document in project documentation (i.e. PMP).
 - 3.1 Provide recommendation on adherence to Level III SR&QA Plan, Level III Software Management Plan and ensure deviations are documented in project documentation (i.e. PMP).
4. Provide S&MA support for the assessment of Project directed Trade Studies.

5. Review Project requirements (i.e. - Requirements Specifications, Interface Control Documents (ICD), Software Development Plan (SDP), Software Requirements Specifications, etc...) and provide applicable comments, and inputs.
 - 5.1 Provide S&MA review and assessment to the CxTF software requirements. (i.e. Level A, B,C,etc)
 - 5.2 Review and verify traceability of parent/child requirements
 - 5.3 Provide S&MA review and assessment to the CxTF Software Development Plan (SDP)
 - 5.4 Provide S&MA review and assessment to the CxTF Risk Management Plan (RMP)
 - 5.5 Provide S&MA review and assessment to the CxTF Configuration Management Plan (CMP)
 - 5.6 Provide S&MA review and assessment to the CxTF Test and Verification Plan (T&VP)
 - 5.7 Provide S&MA review and assessment of any other CxTF Project documents
 - 5.8 Provide inputs to the software assurance portion of the CxTF SDR.
 - 5.9 Provide S&MA review and assessment CxTF ICDs
 - 5.10 Review and recommend approval/disapproval of Verification/Validation of software requirements
 - 5.11 Provide for the S&MA review and assessment of Program/Project Change Requests
6. Provide Comment Sheets and/or RIDs regarding the CxTF Reviews.
 - 6.1 Generate S&MA software comment Sheets and/or Review Item Dispositions (RIDs) and track to closure
7. Assess and provide recommendations for CxTF Project generated presentation materials required for the CxTF SDR
 - 7.1 Perform software process assessments
 - 7.2 Provide / maintain a software classification assessment and software safety assessment.
 - 7.3 Provide for the S&MA software review and assessment of CxTF Project documents, plans, presentations, and analysis in support of Project milestones, reviews and meetings.
 - 7.4 Participate in the CxTF Systems Design Review (SDR).

2.2.3 MORS Support (WBS 1.5.6.4.x)

2.2.3.1 Provide S&MA support to Mission Operations Directorate (MOD) MORS activities to include:

1. S&MA work schedule(s) to meet the Project schedule.
 - 1.1 Assess and provide S&MA recommendations for MORS Project generated presentation materials required for the MORS milestones
 - 1.2 Provide inputs to and participate in the MORS System Definition Review (SDR).
 - 1.3 Provide for the S&MA review and assessment of MORS Project documents, plans, presentations, and analysis in support of Project milestones, reviews and meetings.
 - 1.4 Generate S&MA comment Sheets and/or Review Item Dispositions (RIDs) and track to closure.
 - 1.5 Provide inputs to the MORS Preliminary Design Review (PDR)
2. Assessments, assurance, and analysis in accordance with the schedule.
 - 2.1 Perform software process assessments
 - 2.2 Provide / maintain a software classification assessment and software safety assessment
 - 2.3 Provide the Project Office with a task by task status of S&MA events and actions based on the schedule inputs to the Project master schedule.
 - 2.4 Support the integration of S&MA products / issues between the Level IV Elements and Level III
3. Product assessments and support to applicable safety boards/panels.
4. Support S&MA related presentations for Project and Program boards, panels, and meetings.

- 4.1 Provide S&MA software support to applicable safety boards/panels.
5. S&MA inputs to appropriate Project documents.
6. Provide S&MA expertise for Project safety assessments
7. Provide S&MA support for the assessment of Project directed Trade Studies.
8. Provide software assessments for Project software, firmware, and future up-linkable files in accordance with the MOD SMP.
9. Review S&MA portions of the various Level II documents and Level III Project Plans and documents. (i.e.- SMP, MOD SR&QA Plan, etc...).
- 9.1 Provide recommendation on adherence to Level III SR&QA Plan, Level III Software Management Plan and ensure deviations are documented in project documentation (i.e. PMP).
10. Review Project requirements (i.e. - Requirements Specifications, Interface Control Documents (ICD), Software Development Plan (SDP), Software Requirements Specifications, Software Design Documents, etc...) and provide applicable comments, and inputs.
 - 10.1 Provide S&MA review and assessment of the MORS software requirements (i.e. Level A, B, C, etc)
 - 10.2 Provide S&MA review and assessment of the MORS Software Development Plan (SDP)
 - 10.3 Provide S&MA review and assessment of the MORS Risk Management Plan (RMP)
 - 10.4 Provide S&MA review and assessment of the MORS Configuration Management Plan (CMP)
 - 10.5 Provide S&MA review and assessment of the MORS Test and Verification Plan (T&VP)
 - 10.6 Provide S&MA review and assessment of any other MORS Project documents
 - 10.7 Provide S&MA review and assessment of MORS ICDs
 - 10.8 Review, verify and track traceability of parent/child requirements
 - 10.9 Review and recommend approval/disapproval of Verification/Validation of requirements
11. Provide Safety Data Package assurance as required to support the SDR and PDR. This will include the requirement to provide closure through the appropriate Project tracking log and verification of the log for S&MA items. The tracking log(s) shall be provided by the Project.
 - 11.1 Provide for the assessment of the System Preliminary Hazard Analysis (HA) and System Hazard Analysis.
12. Provide for the S&MA preparation and review of Program/Project Change Requests.
13. Provide S&MA support to the various Program/Project safety boards and panels.
14. Initiate (where applicable), review, and track to closure Anomaly Reports through the Program/Project System.

2.2.4 CxPASS Support (WBS 1.5.6.4.x)

2.2.4.1 Provide S&MA support to CxPASS activities to include:

1. Provide S&MA support for the analysis, preparation, and assessment of Project directed Trade Studies.
2. Provide assessments for Project software and firmware in accordance with the MOD SMP.
3. Review S&MA portions of the various Level II documents and Level III Project Plans and documents. (i.e.- SMP, MOD SR&QA Plan, etc...).
- 3.1 Provide recommendation on adherence to Level III SR&QA Plan, Level III Software Management Plan and ensure deviations are documented in project documentation (i.e. PMP).
4. Review Project requirements (i.e.- Requirements Specifications, Interface Control Documents (ICD), Software Development Plan (SDP), Software Requirements Specifications, etc...) and provide applicable comments, and inputs.
 - 4.1 Provide S&MA review and assessment of the CxPASS software requirements (i.e. Level A, B, C, etc)

- 4.2 Provide S&MA review and assessment of the CxPASS Software Development Plan (SDP)
- 4.3 Provide S&MA review and assessment of the CxPASS Risk Management Plan (RMP)
- 4.4 Provide S&MA review and assessment of the CxPASS Configuration Management Plan (CMP)
- 4.5 Provide S&MA review and assessment of the CxPASS Test and Verification Plan (T&VP)
- 4.6 Provide S&MA review and assessment of any other CxPASS Project documents
- 4.7 Provide S&MA review and assessment of CxPASS ICDs
- 4.8 Review, verify and track traceability of parent/child requirements
- 4.9 Review and recommend approval/disapproval of Verification/Validation of requirements
5. Provide Safety Data Package assurance as required to support the Project through Project requirements Review (PRR) and Software Requirements Review (SwRR). This will include the requirement to provide closure through the appropriate Project tracking log and verification of the log for S&MA items. The tracking log(s) shall be provided by the Project.
 - 5.1 Provide for the assessment of the System Preliminary Hazard Analysis (HA) and System Hazard Analysis.
 - 5.2 Provide S&MA software support to applicable safety boards/panels.
 - 5.3 Provide S&MA software expertise for Project safety assessments
6. Provide for the S&MA evaluation of Program/Project Change Requests.
7. Provide S&MA support to the various Program/Project safety boards and panels.
8. Provide Comment Sheets and/or RIDs regarding the Cx PASS Project Requirements Review and Software Requirements Review
 - 8.1 Provide inputs to and participate in the CxPASS milestone reviews such as Project Requirement Reviews, Software Requirement Reviews, etc.
 - 8.2 Assess and provide S&MA recommendations for Project generated presentation materials required for the milestones
 - 8.3 Generate S&MA software comment Sheets and/or Review Item Dispositions (RIDs) and track to closure.
 - 8.4 Provide for the S&MA review and assessment of CxPASS Project documents, plans, presentations, and analysis in support of Project milestones, reviews and meetings.
 - 8.5 Support S&MA related presentations for Project and Program boards, panels, and meetings
9. Facilitate Hazard Analysis and Failure Mode, Effects Analysis.
10. Evaluate Project Processes for compliance.
 - 10.1 Provide the Project Office with a task by task status of S&MA events and actions based on the schedule inputs to the Project master schedule.
 - 10.2 Perform software process assessments
 - 10.3 Provide / maintain a software classification assessment and software safety assessment.

DELIVERABLES

Requirements Verifications/Certification Status
 SDF Assessments
 S&MA Assessments and Presentations
 Code assessments
 RIDS
 Technical and metric analysis
 Subcontractor performance reports
 Recommendations for acceptance of ADPs and GCARs
 Verify and Track the flowdown of CxP requirements
 Support the Safety Integration for all elements

3.0 PERIOD OF PERFORMANCE: October 1, 2009 - April 30, 2010

4.0 ESTIMATED COSTS:

Contractor may provide travel, training, materials, and other non-labor resources as necessary to support task order requirements. Training may include selected professional discipline-based or spaceflight-based conferences with approval of the TMR.